Monitoring and Evaluation Report
Grand Valley Unit
Colorado River Salinity Control Project
2006

USDA-NRCS
GRAND JUNCTION

EXECUTIVE SUMMARY
GRAND VALLEY
2006

HYDROSALINITY -

- The project plan is to treat approx. 60,000 acres with improved irrigation systems.
- To date 34,565 acres have been treated with improved irrigation systems.
- The project plan is to reduce salt loading to the Colorado River system by 132,000 tons of salt.
- In FY 2006, salt loading has been reduced by 3,280 tons of salt per year as a result of installed salinity reduction practices.
- The cumulative salt reduction applied is 98,726 tons/year, or 74.8 percent of the goal.

COST-EFFECTIVENESS -

- The planned cost per ton of salt saved with FY 2006 contracts (one year) is $83.86/Ton. This figure is calculated as follows:

(FA + TA = Total Cost) X Amortization factor = Amortized cost

Amortized cost / Tons salt reduced = Cost/Ton

FA = Total dollars obligated in EQIP and Parallel Program (including wildlife)

Amortization for **2005 = 0.0718**

TA = technical assistance cost: (FA x 0.67)

OTHER PROGRAM BENEFITS -

- There has been a positive effect to local landowners as a result of salinity practice implementation. The main benefit continues to be labor savings associated with on-farm and off-farm irrigation improvements.
- Irrigation improvements, both on- and off-farm, are seen as valuable improvements in city and county planning departments, and irrigation improvements are codified in development regulations.

GRAND VALLEY
2006

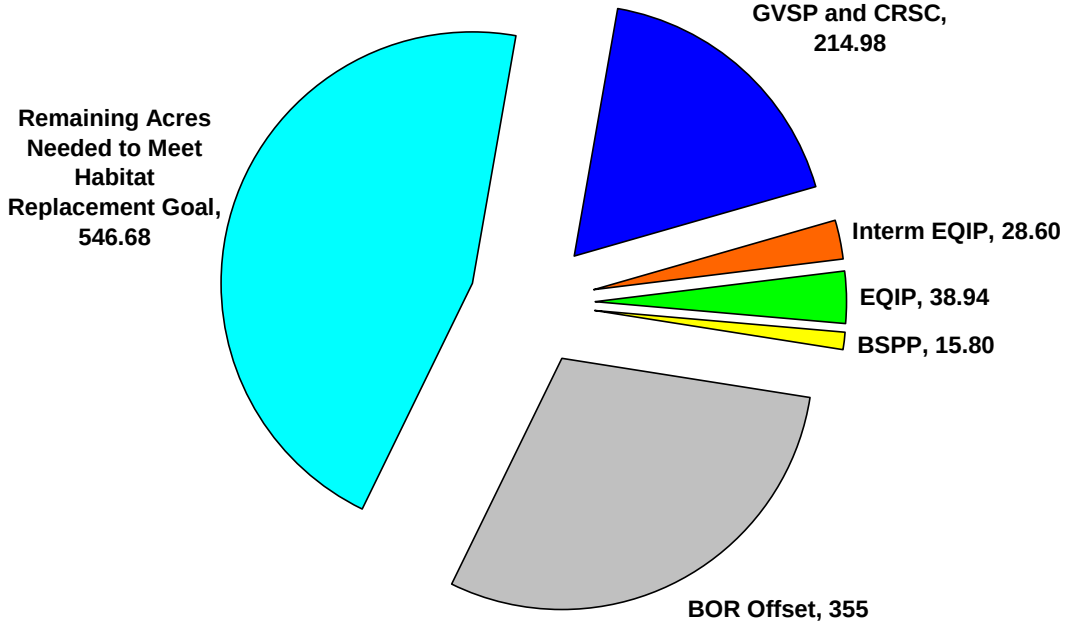
- The program is receiving support from newer ad-hoc governmental and private organizations such as the Grand Valley Selenium Taskforce, and the Wise Water Use Council.
- Landowners irrigating with water from the Grand Valley Water Users' Association have benefited from lower water use, and therefore, lower water costs, as this system charges for water on a volume basis. Water use has been documented in landowner case files.
- Fertilizer use and efficiency contributes to increased yields and lower production costs.

OTHER RELATED ITEMS -

- The number of applications is constant in areas of vineyard and orchard crops.
- The number of applications and the individual size of applications in all other areas of the Grand valley are declining.

EXECUTIVE SUMMARY- WILDLIFE
GRAND VALLEY
2006

Graph 1
Wildlife Acres Applied and Credited to NRCS
Grand Valley Unit



Summary of Wildlife Habitat Planned and Applied (All Salinity Programs)

Wildlife habitat replacement acres planned 1978-2006	1445.25
Habitat replacement acres applied and existing 1978-2006	298.32
Bureau of Reclamation Offset	355
Remaining acres needed to meet habitat replacement goal	546.68

***This does not include 38.2 acres applied with WHIP**

Funding for Wildlife Habitat Replacement Projects (All Salinity Programs)

Funds obligated to wildlife projects 1978-2006	$1,964,468
Funds spent on wildlife projects 1978-2006	$641,913
% of total salinity obligated funds that are obligated to wildlife projects through 2006	6.44%
% of total salinity obligated funds spent on wildlife projects through 2006	2.1%

*** Does not include WHIP**

Summary of Wildlife Habitat Projects Planned and Applied with BSPP funds

Acres planned 2001-2006	282.02
Acres applied and existing 2001-2006	16.3
Funds obligated to wildlife projects 2001-2006	$256,676
Funds spent on wildlife projects 2001-2006	$76,782

Summary of Wildlife Habitat Projects Planned and Applied with WHIP funds

Acres planned in salinity area	190.4
Acres applied and existing in salinity area	38.2
Funds obligated in salinity area	$76,343
Funds spent in salinity area	$33,365

Wetland Data from 1991-2006

Cumulative acres impacted 1991-2006 (Salinity Programs)	42.19
Net AREM change 1991-2006 (Salinity Programs)	+ 22.56
Cumulative acres impacted 1991-2006 (WHIP)	8
Net AREM change 1991-2006 (WHIP)	+ 1.52

HYDRO SALINITY MONITORING AND EVALUATION

The Natural Resources Conservation Service (NRCS) has been placing improved irrigation methodology with selected cost-sharing to cooperators since 1979 through the Colorado River Salinity Control Program. The Colorado NRCS in the Grand Salinity Control Program Unit completed irrigation monitoring on a variety of improved irrigation systems for the crops commonly grown to determine the effectiveness of the salinity control programs in meeting planned goals. Irrigation in the Mesa County area is characterized by mostly gravity-fed systems installed on heavy, clayey soils derived from a marine shale formation (Mancos shale) that is very saline. The intake rates of the soils are generally low to medium. Plentiful and inexpensive irrigation water coupled with the heavy clay soils, long irrigation set times and excessive flow rates continue to be the norm. This leads to deep percolation losses of water and low application efficiencies. The excess water from deep percolation contacts the underlying Mancos shale and subsequently loads salt to the Colorado River. Deep percolation is considered to be the primary indicator of the effectiveness of the irrigation application. A variety of irrigation systems were evaluated including earthen ditches with earth feeder ditches, earthen ditches with siphon tubes, concrete ditches with siphon tubes, ported concrete ditches, pipeline to gated pipe, side roll sprinklers, and micro spray. Crops included alfalfa, corn, small grain, dry beans, orchards, grapes, onions, pasture, and vegetables. This monitoring took place throughout the entire Salinity program period from 1979 to 2003. Data are compiled for 213 site years of measured irrigation inflows, outflows, crop consumptive use, precipitation, and deep percolation.

The data indicate that the salinity projects in Grand Valley are typically achieving a deep percolation reduction of at least 10 to 15 inches for each acre treated which meets or exceeds the 8 inches of deep percolation reduction estimated in the original project reports.

Areas with a greater conversion to sprinkler or micro spray will be at the 15 inch reduction and areas with predominantly flood irrigation will be at the 10 inch reduction. Areas that are converting unimproved flood systems will have deep percolation reductions in the 27 to 32 inch range. Areas that are converting very old systems with limited improvements, will most likely be somewhere between the higher values and the lower values, but probably closer to the 10 to 15 inch reduction than the 27 to 32 inch reduction.

Previous studies have shown that surface water runoff (tail water) does not change appreciably with respect to salinity in the water as it travels from the head of the field to the bottom of the field, but does increase dramatically with respect to sediment load, particularly after a tillage procedure during the first several irrigations on a row crop field. Sediment increases in alfalfa and pasture (grass) irrigated fields are minimal as well as salinity increases. In fact, we have observed a "cleansing" of the irrigation water as it traverses these fields of alfalfa and pasture.

Methods

Beginning in 2004, NRCS, in cooperation with the Mesa Conservation District and the Colorado State Conservation Board began a program designed to place emphasis on Irrigation Water Management (IWM). IWM activities were quite abbreviated in 2005 when compared to 2004 since the position was reduced to a half-time position.

The remaining time for the position was utilized to advise and contribute to the agricultural land to urban land conversion irrigation project. During 2006, a full-time IWM position was again created to continue and increase emphasis on IWM. This person will be fully trained to proceed full-time with IWM in 2007.

For 2006, 1159 acres of existing improvements on 58 fields owned by 15 landowners were investigated and reviewed for adequacy of Irrigation Water Management. Nine of these landowners had installed irrigation improvement on their operation with financial assistance from the salinity control program in past years, from as recently as two years ago to seven years ago, and were installing further systems on remaining land during 2005 and 2006.

All systems observed in 2006 consisted of underground pipeline with valves and hydrants for each set delivering water to gated pipeline. Alfalfa was the dominant crop in 2006. Most Alfalfa grown was for hay production; however 158 acres were grown for seed production. Other crops represented included Barley and Corn.

Efforts for these producers consisted reviewing the basics of irrigation systems with landowners, to determine if these systems were being properly used, and demonstrating changes needed to achieve efficient irrigations. Two field technicians were trained in the basics of irrigation water management. These technicians, both of whom work for the Mesa Conservation District and NRCS conservationists conducted the field visits. Each landowner was interviewed about basic irrigation practices and associated benefits of the improved irrigation systems to their operation. The landowner and technician visited all fields or a representative portion of the fields operated by the landowner.

The following questions were asked during the interview:

- How do you determine when to irrigate?
- What has resulted from your improved irrigation system and operation?
    - Yield changes
    - Labor changes
    - Water Use
    - Other
- What type of record-keeping do you use to track irrigations?

During field visits, observations and measurements were taken to determine if the landowners were applying irrigation water according to guidelines and design parameters provided to them in the irrigation plan.

Results

- Landowners contacted in this group overwhelmingly determine when to irrigate solely by crop appearance. Only three landowners used a probe to ascertain soil moisture conditions as a tool to determine irrigation. The next most popular method to determine when to irrigate was a practiced and historic routine of waiting a certain number of days between irrigations. A few landowners in this category were restrained by more complex delivery problems such as cooperation with other landowners on a lateral requiring rotation and irrigation when “water is available”.
- Four landowners representing 183 acres reported slight yield increases. The remainder reported yields to be approximately the same.
- Every landowner interviewed in 2006 reported significant labor savings; five landowners stating as high as 50 percent labor reduction.
- All but four landowners report using less water as a result of the irrigation system. One landowner reported a 50 percent reduction in water use during the 2006 season.
- Eight landowners reported maintaining records of irrigation water applied. Three landowners reported keeping no irrigation records. The eight landowners keeping accurate records received irrigation water from a provider with a sliding payment scale on a volume basis, and could easily calculate the water savings benefit of the improved irrigation in monetary terms. The three landowners not keeping records received water from an irrigation system with no such sliding scale, as they paid a certain price for water no matter what was actually used.
- Twelve of the landowners were operating the improved irrigation system within the set time and design quantity parameters provided to them in a design.

- Labor savings is the most often reported as the best benefit to improved irrigation systems, although water savings benefits are increasingly mentioned.
- The first irrigation event continues to represent a significant departure from the other irrigation events later in the season. Most landowners reported set times of 12 to 24 hours. Design criteria were provided to landowners to approximate those times as closely as possible, as those times best correspond with farming operations and labor availability. Three landowners reported set times of 36 hours or greater.
- It is estimated that the deep percolation incurred by most of the above landowners will continue to be within the range of improvements documented in earlier years and consistent with program goals.
- Most of the improvement in irrigation is due to "built –in" management constraints such as designing set widths with valves and designing delivery pipelines to deliver a corresponding water flow. Generally, landowners with these systems also receiving water from a water provider with a fee based upon volume of water used perform the best water management.
- There appears to be little interest in considering improved and more reliable methods for determining when to irrigate, such as probing or utilizing a "checkbook" method.

Urban Use of Irrigation Water

Although not a part of the EQIP and the monitoring and reporting requirements of the program, there have been concerns about the potential overuse of irrigation water by suburban and urban users, both newcomers to the area as well as homeowners familiar with the area and the local conditions. In late 2004, the Mesa Conservation District received a grant to study the effects of ex-urban and suburban development on irrigation water use and deep percolation.

Monitoring and study of this segment of land use continued in 2006, and was completed at the end of the irrigation season.

Results and a final report will be completed in May, 2007.

The project goal is to characterize the deep percolation from urban irrigation, and compare it to historic levels of deep percolation from agricultural irrigation. Listed below is the plan of work and representative methodology for the study:

Homeowners

1. Located, contacted, qualified, and trained homeowners for participation in study
2. Developed log forms for homeowner recordkeeping
3. Designed and constructed 11 water pressure data recorder systems
4. Monitored irrigation at 13 home sites – six large sites (five acres) and seven regular sites (1/4 acre sites)
5. On a few sites where available, compare irrigation events on fields with previously installed improved irrigation systems that also have data from the field monitoring and evaluation performed by NRCS and others in earlier years; and that have now been converted to residential or suburban lots
6. Compare area of these fields to the available irrigated area with development(less roads, rooftops, other impervious surface)
7. Monitored irrigation at two native planted (xeriscape) sites
8. Collected soil moisture data from all sites at three different times during season
9. Calculated deep percolation using ET data, precipitation data, homeowner logs, pressure logs, and runoff data for all sites

Parks

1. Monitored irrigation at two park sites – Canyon View Park and Chipeta Commons
2. Collected soil moisture data from both sites at 3 different times during season
3. Calculated deep percolation using ET data, precipitation data, park logs, and runoff data for both sites

Ponds

1. Measured seepage at 2 ponds (Paradise Hills & Chipeta Pines)
2. Surveyed 1 pond (Paradise Hills) and calculated area/capacity curve
3. Collected pan evaporation data for both sites

Total Subdivision Inflow

1. Collected inflow data at 2 subdivisions – Paradise Hills and Chipeta Pines
2. Calculated irrigated turf acres at both subdivision (Terry Franklin)

ET Method Research

1. Contacted many experts on ET, including the principal designers of the NRCS ET method to understand the NRCS study methods for ET
2. Performed statistical comparison study between current ET and historic ET methods to insure compatibility between two data sets

Historic NRCS Data

1. Researched availability of NRCS data
2. Transferred NRCS report data from 1984 thru 2003 from paper to spreadsheet
3. Performed preliminary analysis of NRCS deep percolation data

Irrigation Audits

1. Performed irrigation audits at 13 homeowner sites

Presentations

1. Presented data to Mesa Conservation District Board in December
2. Presented cyber seminar for NRCS, CWCB, and CRWCD principals in January.

Preliminary results and discussion

Preliminary data show a wide range of deep percolation on small acreage and urban lot-size units, similar to the variability found in traditional farmland. It is thought that overall water use would be reduced due to an increase of impervious areas such as streets, curbs and gutters, and rooftops in these urbanizing areas. Indeed, the Grand Valley Irrigation Company, which is impacted to a large extent by urbanization on their system, has documented this to be true.

However, on individual systems, there is the same range of proper water use to misuse

that exists elsewhere.

Demographic and Areal changes in the Grand Valley

For several years it has been reported that parcel and field sizes are changing in the Grand Valley, and that this has begun to limit potential applicants and eligible property to further implement the Grand Valley portion of the salinity control program. For 2006, data were gathered and compiled to determine the extent of these changes. Data were collected from Mesa County Planning and Development Department subdivision and land development records, and County Assessor records to estimate parcel and ownership size changes, if any for the Grand Valley area. Additionally, an estimate of parcel size change was determined by utilizing ArcView (GIS) information. For this comparison, maps, aerial photography coverage, and GIS data layers were utilized to estimate changes and trends from 1999 (the first year GIS data were recorded for these parameters) to 2005. Records of the average contracted acres for cost share programs in the Grand Valley salinity control area from 1986 to 2006 were also compiled. The data are somewhat limited as Mesa County does not keep records for the Grand Valley portion of the county exclusively – data encompass the entire county. However, it was possible to delimit this area with GIS queries. Note, however, that the above represents only an informal review of available data.

Based upon the preceding sources, the following changes can be inferred from the period 1999-2005:

- The Grand Valley (salinity program boundary area)
    - Gained 8,148 parcels smaller than 5 acres in area.
    - Gained 114 parcels in the range 5.1 to 10 acres.
    - Lost 88 parcels in the range 10.1 to 20 acres.
    - Gained 16 parcels in the range 20.1 to 40 acres.
    - Lost 70 parcels in the > 40 acre range.

In addition the following was observed based upon available data:

- The average parcel size in the Grand Valley area was 5.60 acres in 1999 and 4.66 acres in 2006.
- The estimate of average farm size in the Grand Valley at the start of the salinity control program in 1978 was estimated to be 28 acres. (Note that the parcel size and farm size are not interchangeable units, as a farm may have one or more separate parcels or deeds).
- The average contracted acres for the CRSC program (1986-1995) was 48.4 acres.
- The average contracted acres for the Interim EQIP program (1996) was 43.5 acres.
- A summary for the EQIP program for years 1997-2006 is listed below:

	1997	**1998**	**1999**	**200**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Total acres	221	843	1502	1656	817	1820	2253	1774	559	499
Average acres	18.4	60.2	44.2	43.6	24.0	29.8	132.5	30.6	16.0	12.8
Minimum acres	4	3	5	5	3	3	1	0.7	2.7	0.5
Maximum acres	40	235	300	247	110	165	541	158	64	58

Recommendations for Future Monitoring and Discussion

- Monitoring in the salinity control areas has been accomplished and further monitoring would only be redundant. Efforts therefore will proceed toward irrigation water management with selected irrigators.

- For 2007, effort will continue on all new EQIP and BPP contract recipients to

address irrigation water management and proper use of newly installed irrigation systems.

- Emphasis needs to be placed on landowner irrigation scheduling tools and methods such as “checkbook” and field probing for soil moisture observation.
- For 2007, data will continue to be collected and compiled from urban and small acreage sites. The effects of conversion to urban and small acreage land units must be evaluated to assess the effects of the changes on the projected salinity reduction. Many of the areas treated under the program are being converted to smaller 1 to 2 acre parcels. The Grand Valley areas near Grand Junction, Fruita, and Loma are transitioning to these smaller parcels. There appears to be increasing support and transition to smaller parcels in the Grand Valley, in spite of the general community desire for larger lots that create the appearance of more open space, etc.
- They continue to be irrigated, but by a new landowner and with different crops, usually hay or pasture and lawn and garden.
- Many of the larger parcels are being subdivided in the 20 acre to 40 plus acre size and remain in some type of crop production, but under a new owner/manager that works a primary job off the farm and may have no previous experience with irrigation.
- Significant problems still exist in the delivery of water in unimproved and outdated laterals and other group delivery systems. There is a need for these groups to incorporate and improve these systems; however it is increasingly difficult for this to occur. Most laterals have doubled or even tripled the number of users on the laterals due to subdivision, and this influx of inexperience has driven more complaints and operation problems. The EQIP program is poorly suited to planning and providing cost share for improving these systems, as participants must be agricultural producers.

- The cost of improving many of these systems exceeds the cost-effectiveness

limits for the BPP and EQIP programs, set at $60/Ton for BPP and $90/ton for EQIP in 2006.

- Many irrigation systems improved in the early years of the salinity programs are nearing the end of their practice life. This will need to be addressed as some of these systems will eventually need to be replaced. Some systems are capable of lasting far longer than the stated practice life, e.g. underground pipeline, while other systems have definitely deteriorated.
- The participation level of the program and the treated area completed to date show significant success for both the popularity and the past participation of the program. There is still much interest for improvements in parts of the Grand Valley dominated by vineyards and fruit crops. For more traditional crops, the treated acreage level is resulting in fewer applications, as the majority of large acreages have been treated. Many applications are received for irrigation improvements for parcels as small as one acre.
- There are opportunities to assist the new and inexperienced land owners with effective irrigation water management and systems operation.
- The projected salinity reduction for these types of units should be evaluated so appropriate adjustments to cumulative salinity loading information can be made based on measured values.
- Knowing that many of the land units may be facing future land use changes due to development requires adjustments to irrigation system designs to provide a salinity reduction benefit with the current operation. Designs must take into account further and future development, which drives up the current construction costs.
- Cost effectiveness of the Grand Valley program is being affected by the above construction cost increases and by the reduction of the sizes of parcels made available for the cost share programs.

WILDLIFE

History and background:

The Grand Valley Unit is located in west central Colorado adjacent to the Colorado-Utah state line and includes the entire irrigated area of the Grand Valley North of the Colorado River and the area served by the Orchard Mesa Irrigation District on Orchard Mesa. Added to the Grand Valley Unit in 2006 are the Debeque and Whitewater Units. The Debeque Unit is located 24 miles east of Grand Junction adjacent to the Colorado River. The Whitewater Unit is located 7 miles south of Grand Junction adjacent to the Gunnison River. The Grand Valley is characteristic of arid, cold desert ecosystems common to western Colorado and eastern Utah. Historically, the Grand Valley Unit was dominated by desert vegetation communities. Narrow wetlands and riparian zones were located along the Colorado and Gunnison rivers as well as several natural washes. The present mosaic of habitat types (agricultural, riparian, wetland, and desert shrub) is a result of current irrigation systems and practices. With the advent of irrigation and associated waste water return flows and seepage, the natural vegetation has changed. A sparse, saltbush desert community has been converted to crops and habitat types such as wetland, riparian, willow and cottonwood, tamarisk, tall wheatgrass, or a mosaic of these cover types. Habitat types other than cropland are restricted to areas unsuitable for agriculture, such as canal and lateral banks, fence rows, washes, irrigation return flows and drains, roadsides, and other low-lying areas. Agricultural areas are composed of orchards, pastures, and crops. Crops grown vary from peaches, grapes and cherries, to alfalfa, corn and small grains. All crops are entirely dependent upon irrigation for production. The area originally comprised about 66,000 acres of agricultural land; however, urban and commercial development over the last 29 years has reduced the agricultural area to approximately 58,000 acres. Areas west and north of Fruita, Loma, and Mack have large irrigated agriculture fields. Other areas in the unit are characterized by small fields associated with ranchettes and growing specialty crops.

The sizes of most program participant's properties are small (1-20 acres). Many landowners and participants are moving from the city to recently created small parcels. The Grand Valley area is beginning to see a shift in how landowners view and manage the land. Landowners purchase these parcels for open space, privacy, views, and a rural life style. They manage the parcels as "extra-large lots", rather than farms. Many of these landowners are still interested in improving their land and irrigation but not just for agricultural reasons. (See Demographic and Areal Changes in the Hydro salinity section of this report)

Impacts to wildlife and habitat in the Grand Valley Unit are addressed in the Grand Valley Environmental Assessment, prepared jointly by the U.S. Bureau of Reclamation (BOR), U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), and the U.S. Fish and Wildlife Service (USFWS). The Environmental Assessment determined 4000 acres of wildlife habitat would be lost due to improvement of on-farm and off-farm irrigation systems. Based upon analysis of the potential impacts, the assessment and subsequent agreements by the agencies required replacement of the 4000 acres of wildlife habitat. Seventy percent of the replacement requirement was assigned to the BOR. The remaining thirty percent, or 1200 acres, was assigned to the NRCS. In 1993, The BOR purchased 355 acres of property for development of wildlife habitat to augment the NRCS goal of 1200 acres. In previous Monitoring and Evaluation reports for the Grand Valley it was stated that the BOR purchased nearly 400 acres to be credited to the NRCS. A review of documentation shows only 355 acres were purchased, resulting in an NRCS replacement goal of 845 acres.

Wildlife habitat replacement in the Debeque and Whitewater Units will be determined on a site by site basis by an NRCS biologist. Habitat acres that will be negatively impacted by salinity projects in these units will be added to the remaining habitat replacement goal of 845 acres set for the Grand Valley Unit.

Over the last 29 years, salinity and wildlife habitat improvements projects have been

cost-shared by several different programs as documented in table 1. Note that there are some overlaps between programs. Additionally, wildlife habitat has been created in the Grand Valley Unit through the USDA Wildlife Habitat Incentives Program (WHIP). To date, habitat developed with the WHIP program has not been considered salinity project habitat replacement. It is addressed in this document for information purposes.

Table 1. Salinity Control Programs in the Grand Valley Unit

Grand Valley Salinity Control Program (GVSP)	1978 -1989
Colorado River Salinity Control Program (CRSC)	1987 – 1995
Interim Environmental Quality Incentives Program (IEQIP)	1996
Environmental Quality Incentives Program (EQIP)	1997 -2006
Colorado River Basin States Parallel Program (BSPP)	1998 – 2006

Beginning in 2001, additional funding for wildlife projects that would contribute to habitat replacement goals was made available through the Basin States Parallel Program (BSPP). All BSPP wildlife projects are selected through a ranking process developed by an interagency committee. Projects funded with BSPP funds may be located outside of the Grand Valley Unit.

In 1991, the Grand Valley Unit began tracking wetland type and value changes based upon the Avian Richness and Evaluation Methods for wetlands of the Colorado Plateau (AREM). Wetlands impacted by planned conservation practices were evaluated using this method and Circular 39 from USDI to establish an existing habitat value. The impacted wetlands were re-evaluated using the above criteria to determine existing wetland habitat values.

Current methods

In the Grand Valley Unit wildlife habitat replacement progress is tracked by acres.

Additionally, wetland habitat value changes are assessed using AREM as described above. In an interagency meeting on December 10, 2004 it was agreed, that only habitat development currently on the ground will be credited for habitat replacement. 845 acres of habitat replacement assigned to NRCS will need to be on the ground when the project is finished. At project end, past NRCS habitat development that no longer exists (due to a variety of reasons) will not be credited to NRCS. The process of reporting and field verification of program results and records will continue for the remainder of the program.

For the duration of the salinity program, the type of wildlife improvement practices has remained consistent. Practices include ponds, fencing, grass and forb establishment, brush (tamarisk control) management, and tree and shrub establishment. Pond construction includes membrane lining at all locations except where the pond is at equilibrium with an existing water table. To address Colorado River endangered fish concerns, all ponds are constructed with fish screens on outlet structures (unless the pond will be drained during winter), and, water depletion loss is calculated and reported to the U.S. Fish and Wildlife Service for their review.

Results

Progress from wildlife projects, both planned and applied, is updated yearly in a spreadsheet maintained by the NRCS Grand Junction Field Office. This data represents the final audit and update for all wildlife projects in the Grand Valley Unit, and are verified from field visits performed by a wildlife biologist. Salinity and wildlife habitat improvements have been cost-shared by several different programs.
Progress in acres of wildlife habitat replacement by program is illustrated by Graph 1. Table 2 summarizes the applied data for all salinity programs. Table 3 is a summation of dollars spent on wildlife projects with salinity program funds. Table 4 summarizes the wildlife habitat replacement acres and funding for the BSPP program.
Table 5 summarizes the wildlife acres and funds for the WHIP program spent in the salinity area. WHIP acres applied in Table 5 are not included in Table 2.
Wetland data collected over the last 15 years for all salinity programs and WHIP is summarized in Table 6.

Graph 1
Wildlife Acres Applied and Credited to NRCS
Grand Valley Unit

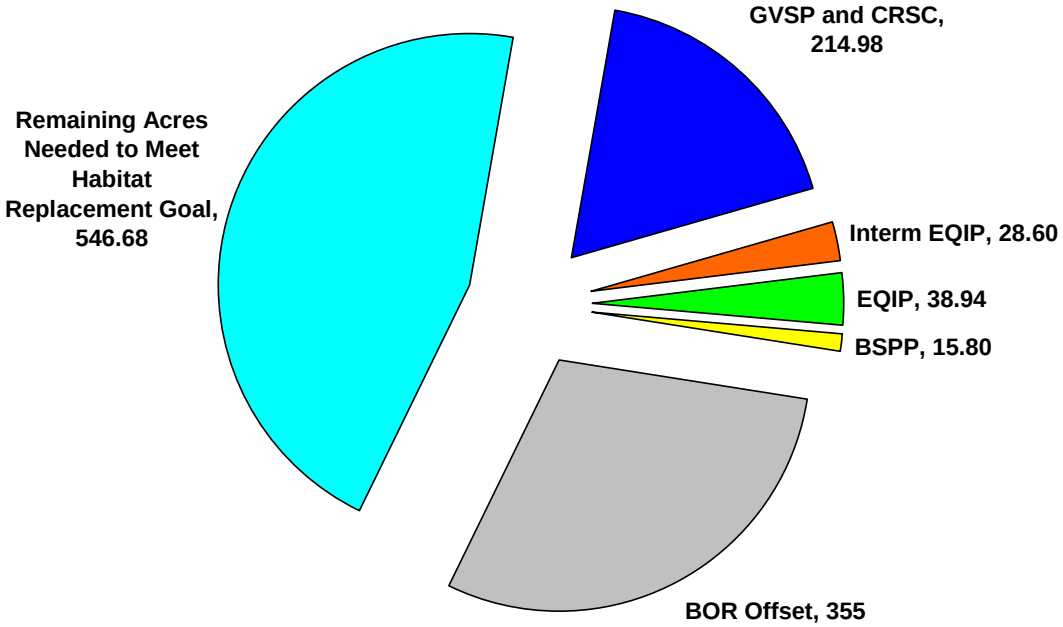


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Table 3. Funding for Wildlife Habitat Replacement Projects (All Salinity Programs)

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Table 4. Summary of Wildlife Habitat Projects Planned and Applied with BSPP Funds

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Table 5. Summary of Wildlife Habitat Projects Planned and Applied with WHIP funds

Acres planned in salinity area	190.4
Acres applied and existing in salinity area	38.2
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Table 6. Wetland Data from 1991-2006

Cumulative acres impacted 1991-2006 (Salinity Programs)	42.19
Net AREM change 1991-2006	+ 22.56

(Salinity Programs)	
Cumulative acres impacted 1991-2006 (WHIP)	8
Net AREM change 1991-2006 (WHIP)	+ 1.52

Discussion of Results

Over the last 29 years 5 salinity programs have been utilized to replace wildlife acreage as outline in Graph 1. A majority of the replacement effort has been a result of the CRSC and GVSP salinity programs. The EQIP program has produced 38.94 acres in ten years. During the first 7 years of the EQIP program, wildlife and irrigation projects for the same landowner were often combined in one contract and there was a high cancellation rate of the wildlife portion of the contract. Since 2004 all wildlife contracts under EQIP are separate contracts and cancellation rates have decreased.
The NRCS replacement effort has resulted in 298.32 acres of wildlife habitat applied and existing as outlined in Table 2. These applied and existing acres account for about 20% of all planned projects. NRCS funded projects and the BOR offset of 355 acres has resulted in a total of 653.32 acres of wildlife habitat credited to the Grand Valley Unit. An additional 546.68 acres of habitat replacement is required to achieve the 1200 acre goal.

Funding of wildlife projects from all salinity programs is outlined in Table 3. To date, $641,913 has been spent on wildlife projects in the Grand Valley Unit, which is 2.1% of the total obligated funds for all salinity programs. Over the last 29 years, $1,964,468 has been obligated to wildlife projects in the Grand Valley Unit, which is 6.44% of the total funds obligated to for all salinity programs. The BSPP program has planned 282.02 acres of wildlife habitat since 2001 as detailed in Table 4. Currently 16.3 acres have been applied with this program. A total of $256,676 BSPP funds have been obligated to wildlife in the Grand Valley Unit, with $76,782 spent to date on wildlife

projects.

Wildlife projects planned using WHIP funds are outlined in Table 5. The values in table 4 are not included in either Table 2 or Table 3. Currently there are 190.4 acres planned in the Grand Valley Unit under WHIP. At this time there have been $76,343 of WHIP funds obligated in the Grand Valley Unit, and a total of $33,365 has been spent on wildlife projects. During 2006 there was no change in wetland data for both salinity program projects and WHIP projects. Values identified in Table 6 do not include wetlands created in 2006. Wetlands created in 2006 will be evaluated in 2009 to allow time for vegetation to establish and wetland functions to develop.

Conclusion

Replacement effort for wildlife acres is dynamic as urban development impacts areas that once were managed for wildlife under the salinity programs. Each year wildlife acres are applied throughout the Grand Valley Unit, but acres are also removed as identified by periodic field checks by an NRCS biologist. Effort must be placed upon increasing the interest of landowners to establish and maintain wildlife habitat. Direct contact with landowners that own large parcels or land along natural washes and drainages may be beneficial. With increasing numbers of landowners having small parcels, the salinity program must adjust to accommodate smaller areas.
Although it is difficult to find locations on small parcels that can be secluded and protected from roadways and headquarters, NRCS can capitalize on these opportunities by demonstrating the benefits of improving small open space parcels for wildlife habitat.

Cancellation rates of EQIP wildlife contracts have decreased with the advent of separate contracts for wildlife projects. Retention rates should also improve as practice lifespan for practices associated with wildlife habitat have increased from 10 years under the GVSP program, to 20 and 25 years under current programs.
Retention of applied wildlife habitat acres may also be increased by working with lands that have conservation easements in place. This would entail working closely with land

trust organizations to identify possible landowners with conservation easements that are wildlife oriented. Working with Mesa County and the cities of Grand Junction, Fruita, and Palisade to establish projects located in development buffer zones may increase opportunities for wildlife projects with willing landowners.